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the Tioghe. This is not improbable, as a water-parting seems to run from 18° to 19° E. long., in this portion of Africa which separates the waters which run into the Atlantic from those that run eastward to the Liambaye or Liambige and the Indian Ocean. Vast copper mines are found about 100 miles E.S.E. of the lake mentioned, and the carriage of the ore forms a great trade to the people of Ovampo.

The intention of the party was to proceed N.E. to a place or chief named Libele, whose abode is to the S. of Bunda in about 16° S. lat. and 21° E. long. In this portion of Africa snow is stated to be found on high mountains in July and August. In the direction alluded to they expected to reach the Cunene, but which they never could have done, as the meridian of the upper part of that river is in about 17° E. long. Their course would have carried them across the Cubango, and its tributaries which form the Chobe, a great feeder of the Liambige. But they durst not venture to proceed from Ovampo in that direction, as at that season of the year water cannot be found for a great distance. Brocheda and Ladislaus, who both visited this district, the former in 1849 and the latter in 1852 and 1853, tell us that this district of Africa between Ovampo and the Cubango, including the great state of Quanhama on the S.W. side of that river, and called also Aimbiri from the name of the chief, is very dry in the dry season of the year, and generally a plain or level tableland with scarcely a stone to be found in it. Copper and iron are most abundant throughout it, and good water is frequently found in very deep holes, the remains of the floods in the rainy season from November to April, when the rains are very heavy. Both Brocheda and Ladislaus mention the great river Liambaye or Liambige running to the eastward, and that the country in that part of its course had been overrun and conquered by the Makololo, or as Brocheda, perhaps by an error of the Portuguese press, calls them, the Makakotto. The population of the portion of Africa here specifically alluded to are represented by traders and travellers who have visited them as extremely rude, ignorant, and barbarous.

4. *Journal kept during the performance of a Reconnoissance Survey of the South District of the Province of Otago, New Zealand.* By J. TURNBULL THOMSON, F.R.G.S., Chief Surveyor, Otago.

IN the beginning of 1857 Mr. Thomson explored, in successive trips, the southern extremity of New Zealand, travelling on foot over 1500 miles of difficult country, carrying his theodolite and "swag" of clothes on his back, and driving pack horses laden with flour.

The epitome of his results is contained in the following Table.

Nature of Country reconnoitred between the Waiau and Matuaru Rivers, and the UMBERELLA, EYRE, and TUKITUNO MOUNTAINS.

Square miles.					POPULATION.				
Forest land	..	..	..	570	<hr/>				
Moss and swamp	..	..	..	108	Europeans	..	..	..	253
Agricultural	..	..	..	400	Half-castes	..	..	..	70
Pastoral	..	..	..	2150	Maoris	..	..	..	119
Barren (mountainous)	..	..	..	500	<hr/>				
Total	..	..	..	3728	Total	..	..	..	442

There is also a table of barometrical altitudes and a comparative vocabulary of Maori and Malay words. Numerous latitude observations are alluded to, but do not appear in the present paper.

A large part of the country traversed, was utterly destitute of man; the white race not having reached so far, and the aborigines (the Maori) having abandoned it. There are marks of the previous existence of the latter in numerous small ovens scattered about the country; those that are on the skirts of forest land were usually found complete and apparently recent, those that are in the open country were broken and very old. Mr. Thomson remarks that natives would always build their ovens where wood was abundant, and argues that there has been a gradual diminution of forest land, and that ovens have been successively built on the borders of the forest as it gradually receded. Now the edges of the forest are choked with scrub grasses and ferns, which, on being set fire to, burn vigorously, destroying to various depths a fringe of the adjacent trees. In about three years' time, grass takes the place of the burnt scrub; scrub ultimately takes the place of the burnt forest; and thus the forest has a constant tendency to retrograde where fires are frequent, either from accident or design.

Other marks exist which have frequently been ascribed to the handiwork of aborigines, but which our author traces to an entirely different source. They are small mounds, sometimes heaps of stones, with little or no earth, which are scattered promiscuously about the country. On one side of them, is invariably a hollow. He attributes them to fallen trees, that have uprooted a large quantity of earth, which is left as a heap after their complete decay, the rains having washed out more or less of the earth and left the stones where they were. The hollow is the place where the root formerly stood.

There is much grandeur in the scenery of the part of New Zealand traversed by Mr. Thomson. The higher course of the Matuaru, its fall, and the Dome Mountain are especially mentioned. The Dome is only 4505 feet high, but it commands a grand and extensive view from the eastern to the south-western coast, and embraces the serrated edges of the Eyre Mountains, covered with snow. The height of the snow-line is not mentioned, but on Mr. Thomson ascending the Dome, and also an adjacent peak of much the same altitude, on the 15th of February (corresponding to our 15th of August), when the day was a hot one on the plains below, water froze during the time he was making his observations, in the one case at 10 A.M. and in the other at noon.

Mr. Thomson has collected some facts, which give hope that the

great bird, the Moa, may yet exist. Between the Waiau River and the West coast the country is covered with forest up to the snow line. It is a tract of 100 miles N. and S. and 50 miles E. and W., and here, and here only, are there hopes of finding live specimens of the gigantic bird the moa; and considering the very recent indications of its presence, everywhere found in the vicinity, the supposition of its existence at the present time, at least, has grounds for entertainment.

Jacob River settlement deserves some notice. It formed one of the many whaling stations that formerly studded the coast of New Zealand, and is now probably the only place where whaling is still carried on. Twenty or thirty years ago, when whales were numerous, vessels came here from Sydney and Hobart Town, but owing to the savage character of the natives, the captains of the ships kept as much aloof from them as possible, and selected stations that were naturally safe from sudden attacks. Codfish Island was the best of these; it is situated in a stormy sea, with only one landing place, and in a convenient position for whaling and sealing.

The natives of the coast, and of Centre Island and Raupuki, were 3000 to 4000 in number, and warlike as they were, were nevertheless inferior in strength to the northern tribes, who made constant raids upon them. Consequently they were driven to the islands from motives of fear similar to those which made the whalers select Codfish Island as their station. Friendly relations and inter-marriages between the whites and the aborigines soon followed, and, as a fruit of their mutual confidence, the white man began to extend the scene of his enterprises along the coast, other settlements were formed, and Codfish Island fell into secondary importance. These new settlements were The Bluff, New River, Waikawa, Jacob River, &c., and they all flourished so long as whales continued plentiful. But a change took place, the whales were nearly exterminated and the remainder deserted these waters. The native race declined rapidly in number; measles alone swept off two-thirds of them, and other imported diseases were very destructive; at present the natives of these parts do not exceed 400 in number.

Centre Island is deserted; a few natives live scattered among the settlements, but the principal remnant is at Raupuki. As to the Europeans, such as had not contracted ties with the natives removed elsewhere, the others eked out a dull existence; their native wives tilled the ground, and now and then a ship called, ready to exchange tobacco, &c., for potatoes and fresh pork. Such was the condition of this part of New Zealand, until within the last two years, when

the purchase of the country from the aborigines opened it out to civilization. But Jacob River was an exception: it had been kept from the fate of the other settlements, mainly owing to the energy of Mr. Hanwell, who imported stock from Australia, sent whaling and sealing expeditions to the almost unknown West coast of New Zealand, and encouraged such branches of industry as were available. The inhabitants are now remarkably thriving. Mr. Thomson draws a close parallel between the present condition of Jacob settlement and that of the Shetlands many years since, as described by Sir Walter Scott; there is the same seclusion from a more stirring world, the same pursuits and the same social condition. The west of New Zealand is the scene of their whaling and sealing enterprise; its coast is remarkably stormy, but sounds and promontories alternate in such close succession that harbours of refuge are everywhere to be found. The water is exceedingly deep close in to shore, and vessels frequently moor to the trees, where they are securely protected from wind by the steep cliffs. The natives of Jacob's Town profess Christianity; they dress and build cottages in European fashion, and these, by the way, are remarkably tormented with fleas.

Finally, Mr. Thomson draws a humorous comparison between the occupations and way of living of an officer on the Indian survey (in which he formerly served) and those of his present employment. Notwithstanding the rude work of the latter, he considers the health and hearty enjoyment of life to more than compensate for the absence of luxuries, from which the languor of an Indian climate had removed the zest.

5. *On the Fine Regions of the Trade Winds.* By THOMAS HOPKINS, M.B.M.S., V.P. of the Manchester Literary and Philosophical Society.

MR. HOPKINS' paper is a sequel to other writings,* in which he has proposed a new theory upon the causes of trade winds and monsoons. It is not specially explained in the present communication, but as it is alluded to, throughout its pages, a concise description of it becomes necessary. Mr. Hopkins denies many of the facts usually quoted in support of the commonly received Hadleian theory; he adduces others, which he considers to be at variance with it, and maintains that the prime mover of these atmospheric phenomena

* See Journal of the Royal Geographical Society, vols. 26 and 27; and Transactions of the Royal Society.